AMENDMENTS TO THE CLAIMS

1. (ORIGINAL) A method of making an antibody molecule, the antibody containing an immunoglobulin heavy chain comprising a α3 domain or a mu domain, the method comprising:

(a) Providing a nucleotide sequence encoding the immunoglobulin heavy chain;

(b) Modifying the nucleotide sequence in the region of the nucleotide sequence encoding the C-terminus 18 amino acids of the completed heavy chain to remove, or reduce the effectiveness of, one or more vacuolar targeting signal sequences to form a modified nucleotide sequence;

(c) Inserting the modified nucleotide sequence into a host cell; and

(d) Causing the host cell to express the modified nucleotide sequence to form the modified antibody heavy chain and secrete the modified antibody heavy chain from the host cell.

2-33. Cancelled

34. (NEW) A method according to claim 1 wherein the heavy chain molecule is IgA, IgM or an IgA/G hybrid.

35. (NEW) A method according to claim 1 wherein nucleotide sequence is modified by one or more point mutations of the nucleotide sequence, deleting one or more nucleotides, adding one or more nucleotides and/or replacing one or more nucleotides with a synthetic nucleotide sequence.

36. (NEW) A method according to claim 35, wherein the synthetic nucleotide sequence encodes an amino acid sequence of general formula:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = a cysteine residue

Xaa_1 = independently any amino acid with the proviso that it is not from I, L or forms a consecutive sequence X_1 X_2 X_3 V S X_4

where: X_1 = N, H or L

X_2 = V or Y

X_3 = S or N

X_4 = aliphatic amino acid

Xaa_2 = independently any amino acid

m = at least 2

n = 0 to 5.

37. (NEW) A method according to claim 36, wherein Xaa_2 is Y and n = 1.

38. (NEW) A method according claim 1, wherein nucleotides encoding the last 16 amino acids of the heavy chain are deleted.

39. (NEW) A method according to claim 1 wherein the resultant amino acid sequence at the C terminus of the heavy chain has a formula selected from:

(a) SCMVGHEALPMNFTQKTIDRLSGKPACY,

(b) SCMVGHEALPMNFTQKTIDRLSGKPAAACY,

(c) SCMVGHEALPMNFTQKTIDRLSGKPHASTPEPDPVACY and

(d) SCMVGHEALPMNFTQKTIDRLSGKPAAAAACY

40. (NEW) A method according to claim 1 wherein the nucleotide sequence modified originally encoded the amino acid sequence:

X_1 X_2 X_3 V S X_4

where: X_1 = N, H or L

X_2 = V or Y

X_3 = S or N

X_4 = aliphatic amino acid.

41. (NEW) A method according to claim 40, wherein the amino acid sequence is: N V S V S V.

42. (NEW) A method according to claim 1 wherein the nucleotide sequence modified encoded L or I.

43. (NEW) A method according to claim 42, wherein the modified amino acid is one or both of an isoleucine 3 amino acids and/or 10 amino acids from the C-terminus end of the completed heavy chain.

44. (NEW) A method according to claim 1, wherein the nucleotide sequence modified is within the sequence:

P T X_1 X_2 X_3 V S X_4 X_5 X_6 X_7 X_8 X_9 X_{10} X_{11} X_{12} C X_{13}

where: X_1 = N, H or L, preferably N

X_2 = V or Y, preferably V

X_3 = S or N

X_4 = an aliphatic amino acid, preferably V or L

X_5 = an aliphatic amino acid, preferably I, V or L

X_6 = M, V or L, especially M

X_7 = S or A

X_8 = E or D

X_9 = any amino acid, preferably G, V, A or T

X_{10} = D, E, G or A, preferably D

X_{11} = G or S, preferably G

X_{12} = I, T, V, Z or A, preferably I or T

X_{13} = may or may not be present and, where present is A or Y

45. (NEW) A method of adding J-chain binding capability to the heavy chain of an antibody comprising the steps of:

(a) providing a nucleotide encoding an immunoglobulin heavy chain;

(b) adding to that nucleotide a nucleotide sequence encoding a synthetic tail with the amino acid sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = Cys

Xaa_1 is independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence X_1 X_2 X_3 V S X_4 (where X_1 = N, H or L; X_2 = V or Y; X_3 = S or N; X_4 = aliphatic amino acid)

Xaa_2 = independently any amino acid

m = at least 2
n = 0 to 5; and

(c) expressing the completed nucleotide in a host cell to form an immunoglobulin heavy chain capable of binding J-chain.

46. (NEW) A method according to claim 1 wherein the host cell is a plant cell.

47. (NEW) A method according to claim 45 wherein the host cell is a plant cell.

48. (NEW) A method according to claim 46, wherein the plant cell is part of a transgenic plant.

49. (NEW) A method according to claim 47, wherein the plant cell is part of a transgenic plant.

50. (NEW) A method according to claim 1 additionally comprising the step of isolating and purifying the antibody molecule.

51. (NEW) A method according to claim 45 additionally comprising the step of isolating and purifying the antibody molecule.

52. (NEW) A method according to claim 50, wherein the antibody is subjected to a protease digest to for Fab or $F(ab')_2$ fragments.

53. (NEW) A method according to claim 51, wherein the antibody is subjected to a protease digest to for Fab or $F(ab')_2$ fragments.

54. (NEW) An antibody containing a heavy chain comprising an α3 domain or a mu domain, the α3 domain or mu domain lacking one or more targeting signals towards the C-terminal end.

55. (NEW) An antibody capable of binding J-chain comprising at its C-terminal end the sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = Cys

Xaa_1 is independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence X_1 X_2 X_3 V S X_4 (where X_1 = N, H or L; X_2 = V or Y; X_3 = S or N; X_4 = aliphatic amino acid)

Xaa_2 = independently any amino acid

m = at least 2

n = 0 to 5

56. (NEW) An antibody according to claim 54 which does not contain the targeting signal: X_1 X_2 X_3 V S X_4

where: X_1 = N, H or L

X_2 = V or Y

X_3 = S or N

X_4 = aliphatic amino acid.

57. (NEW) An antibody according to claim 55 which does not contain the targeting signal: X_1 X_2 X_3 V S X_4

where: X_1 = N, H or L

X_2 = V or Y

X_3 = S or N

X_4 = aliphatic amino acid.

58. (NEW) An antibody according to claim 56, wherein the targeting signal is N V S V S V.

59. (NEW) An antibody according to claim 57, wherein the targeting signal is N V S V S V.

60. (NEW) An antibody according to claim 54 which contains one or no isoleucine or leucine amino acids within the last 18 amino acids at the C-terminus of the heavy chain of the antibody.

61. (NEW) An antibody according to claim 55 which contains one or no isoleucine or leucine amino acids within the last 18 amino acids at the C-terminus of the heavy chain of the antibody.

62. (NEW) An antibody according to claim 54 comprising at the C-terminus end of the heavy chain of antibody, the sequence:

$-(Xaa_1)_m C(Xaa_2)_n$

where: C = cysteine residue

Xaa_1 = independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence X_1 X_2 X_3 V S X_4
where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid
Xaa_2 = independently any amino acid
m = at least 2
n = 0 to 5.

63. (NEW) An antibody according to claim 55 comprising at the C-terminus end of the heavy chain of antibody, the sequence:

$-(Xaa_1)_m\ C(Xaa_2)_n$

where: C = cysteine residue
Xaa_1 = independently any amino acid with the proviso that it is not I or L or forms a consecutive sequence X_1 X_2 X_3 V S X_4
where: X_1 = N, H or L
X_2 = V or Y
X_3 = S or N
X_4 = aliphatic amino acid
Xaa_2 = independently any amino acid
m = at least 2
n = 0 to 5.

64. (NEW) An antibody according to claim 54 in which at least two, preferably two to four, glycine or alanine residues are present downstream of a C-terminal targeting sequence

65. (NEW) An antibody according to claim 55 in which at least two, preferably two to four, glycine or alanine residues are present downstream of a C-terminal targeting sequence

66. (NEW) An antibody according to claim 54 in which at least the terminal amino acid residue of a C-terminal targeting sequence is replaced by at least two, preferably two to four, glycine or alanine residues.

67. (NEW) An antibody according to claim 55 in which at least the terminal amino acid residue of a C-terminal targeting sequence is replaced by at least two, preferably two to four, glycine or alanine residues.

68. (NEW) A method of treating a disease by administering an antibody according to claim 54 to a patient.

69. (NEW) A method of treating a disease by administering an antibody according to claim 55 to a patient.

70. (NEW) A method of prophylaxis, comprising administering an antibody according to claim 54 to a person or animal.

71. (NEW) A method of prophylaxis, comprising administering an antibody according to claim 55 to a person or animal.

72. (NEW) A vector comprising a nucleotide sequence encoding an antibody according to claim 54.

73. (NEW) A vector comprising a nucleotide sequence encoding an antibody according to claim 55.

74. (NEW) A host cell comprising a nucleotide sequence encoding antibody according to claim 54.

75. (NEW) A host cell comprising a nucleotide sequence encoding antibody according to claim 55.

76. (NEW) A host cell comprising a vector according to claim 72.

77. (NEW) A host cell comprising a vector according to claim 73.

78. (NEW) A transgenic plant comprising a nucleotide encoding an antibody according to claim 54.

79. (NEW) A transgenic plant comprising a nucleotide encoding an antibody according claim 55.

80. (NEW) An immunoassay comprising an antibody as defined in claim 54.

81. (NEW) An immunoassay comprising an antibody as defined in claim 55.